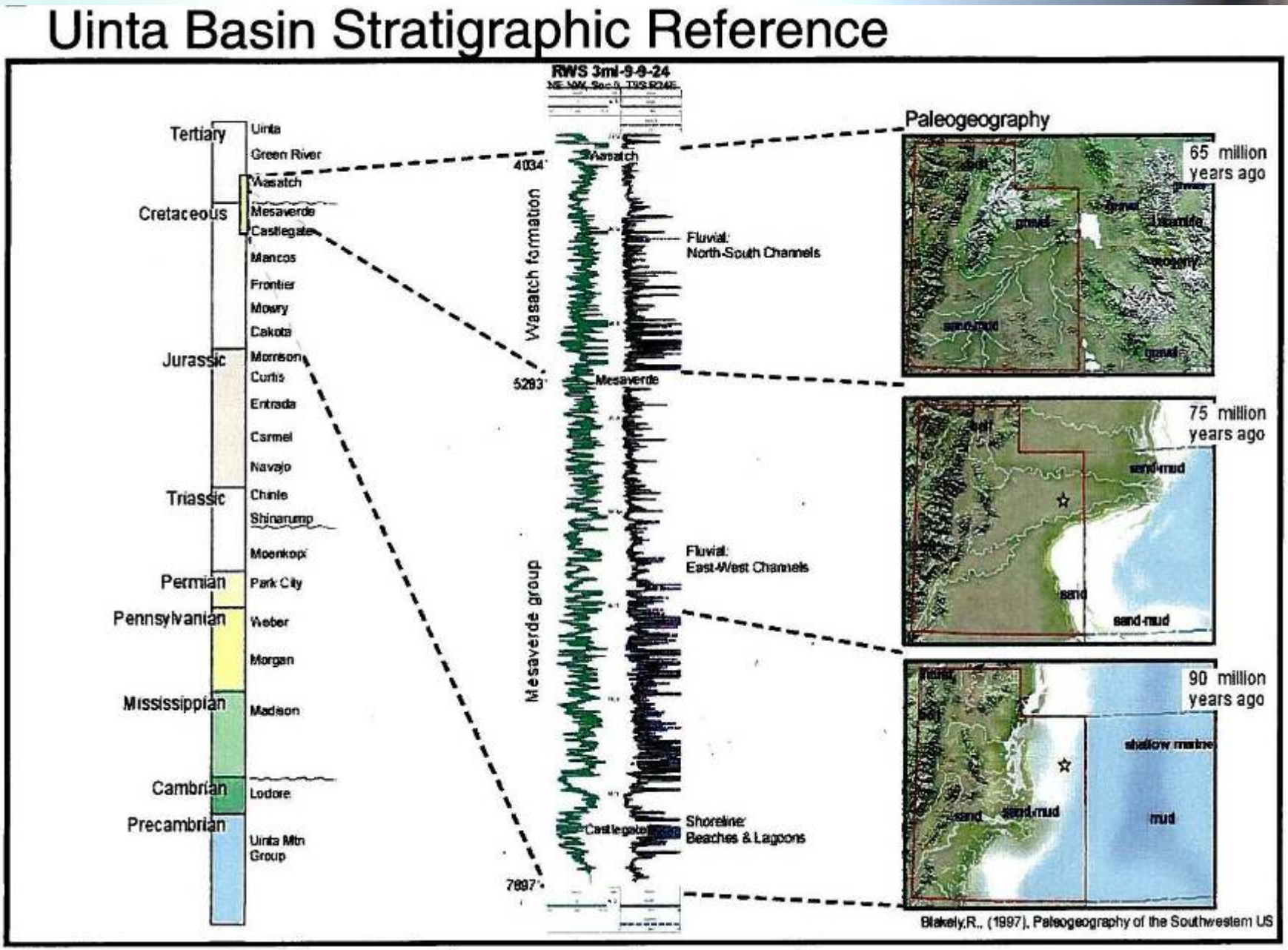
UtahAmerican Energy, Inc.
Tower Mine

Belt Air Technical Study Panel Presentation, Salt Lake City, Utah

May 17, 2007

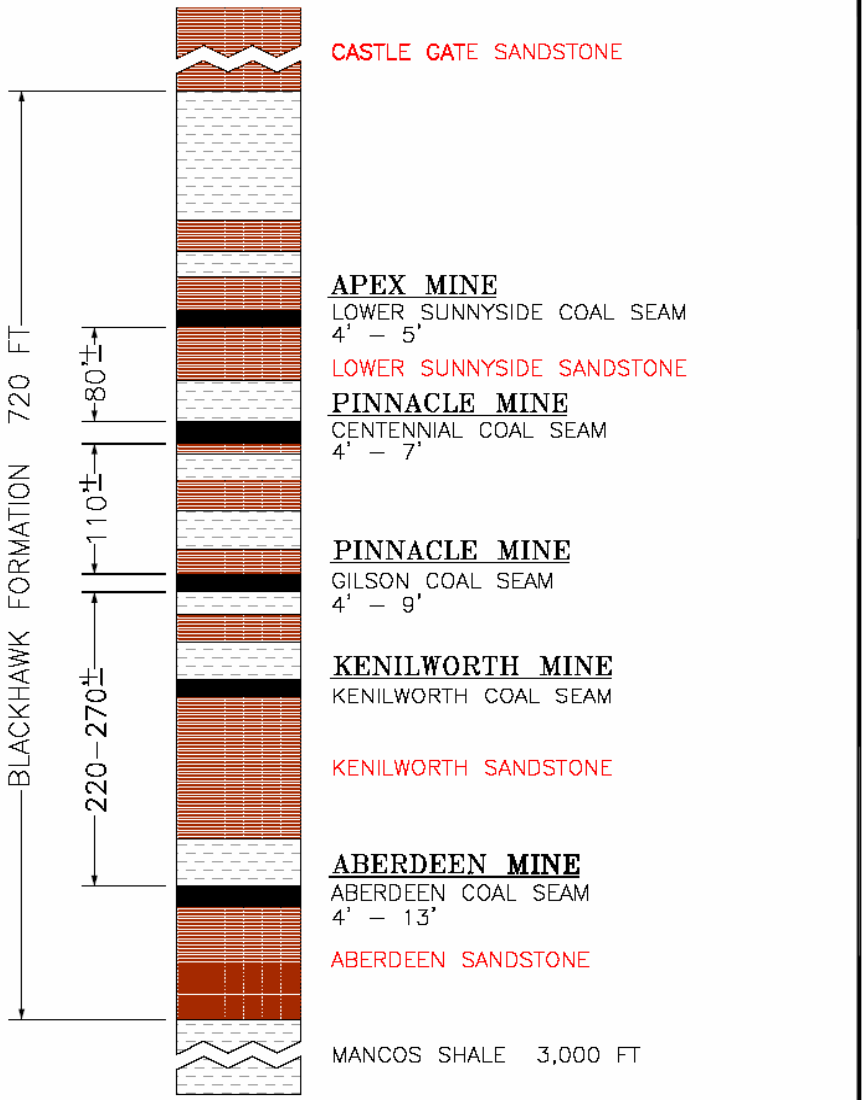
MSHA/OSRV
Document Number 183

Uinta Basin Stratigraphic Reference



Coal Field Characteristics

- Mountainous terrain / steep incised canyons
- Massive sandstone / siltstone cliff forming members
- Several major coal seams sit directly on top of massive beach sandstones
- Poorly defined and widely spaced joint pattern in rock formations
- Low to negative angle of draw around gob areas (-15 to +25 degrees)
- Major sandstone channels
- Rolls
- Deep cover (up to 3,000’)
- Faulted
- Strong brittle coal
- Multiple seam mining



GENERALIZED SECTION
BLACKHAWK FORMATION
DEADMAN CANYON

UtahAmerican Energy, Inc.

794 NORTH "C" CANYON ROAD, EAST CARBON, UTAH 84520
P.O. BOX 1077, PRICE, UTAH 84501
PHONE: (435) 888-4000 FAX: (435) 888-4002

GENERALIZED SECTION

ABERDEEN MINE
TOWER DIVISION
6750 AIRPORT ROAD
PRICE, UTAH 84501

MSHA MINE ID #42-02026

DRAWN BY: PJ	SCALE: NONE
APPROVED BY: LA	DATE: 14 MAY 2007
SHEET:	FIGURE 1

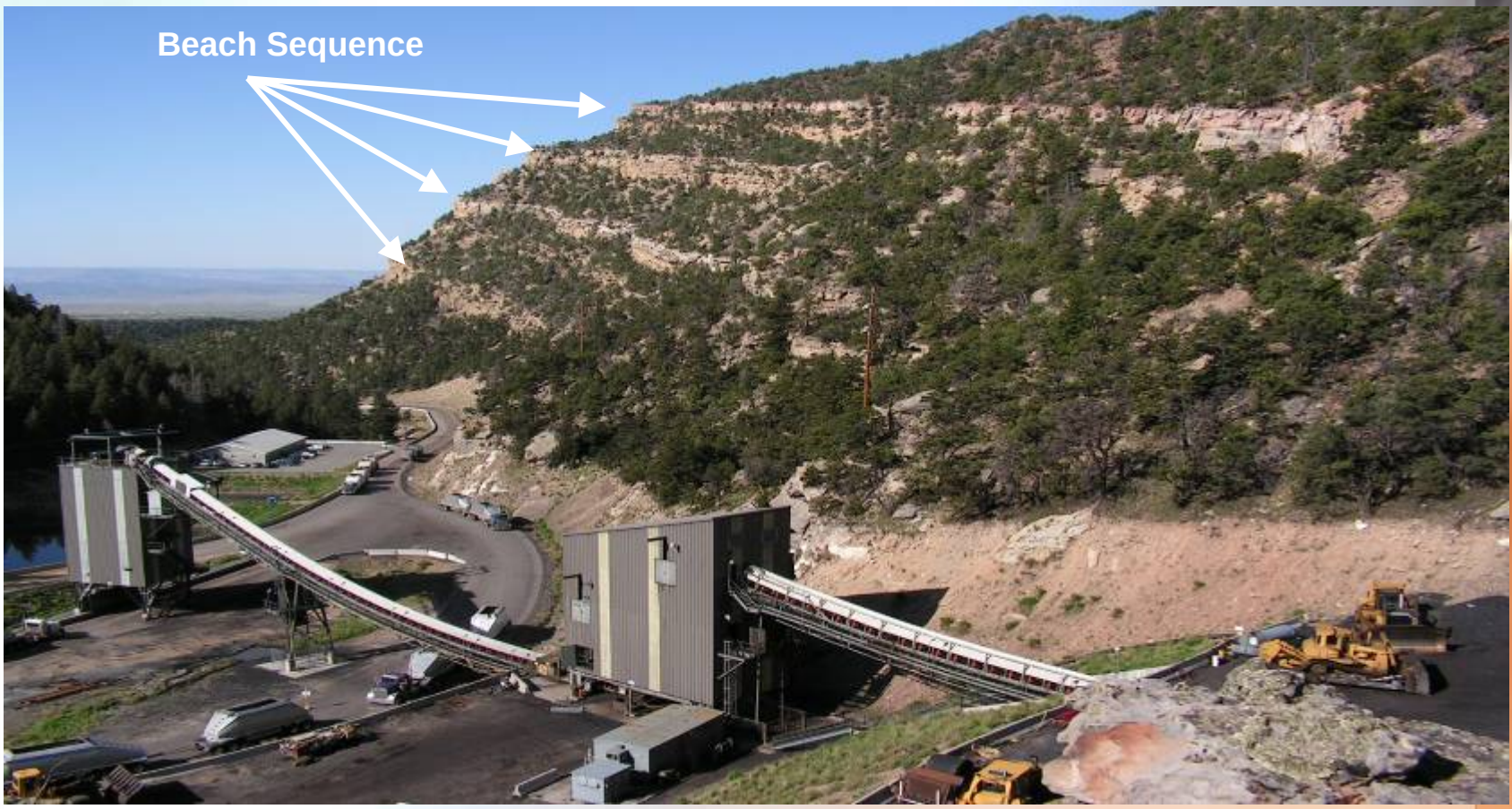
UEI Tower Mine

Belt Air Presentation

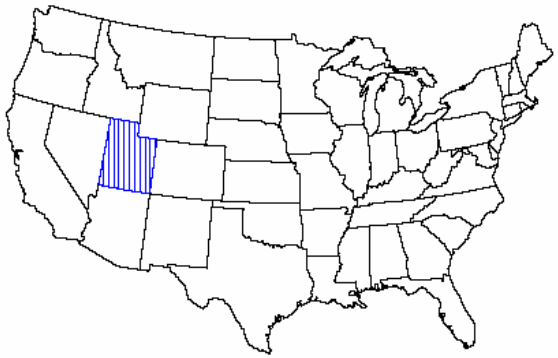

Castle Gate Sandstone

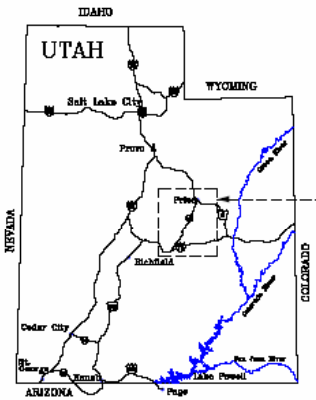
UEI Tower Mine

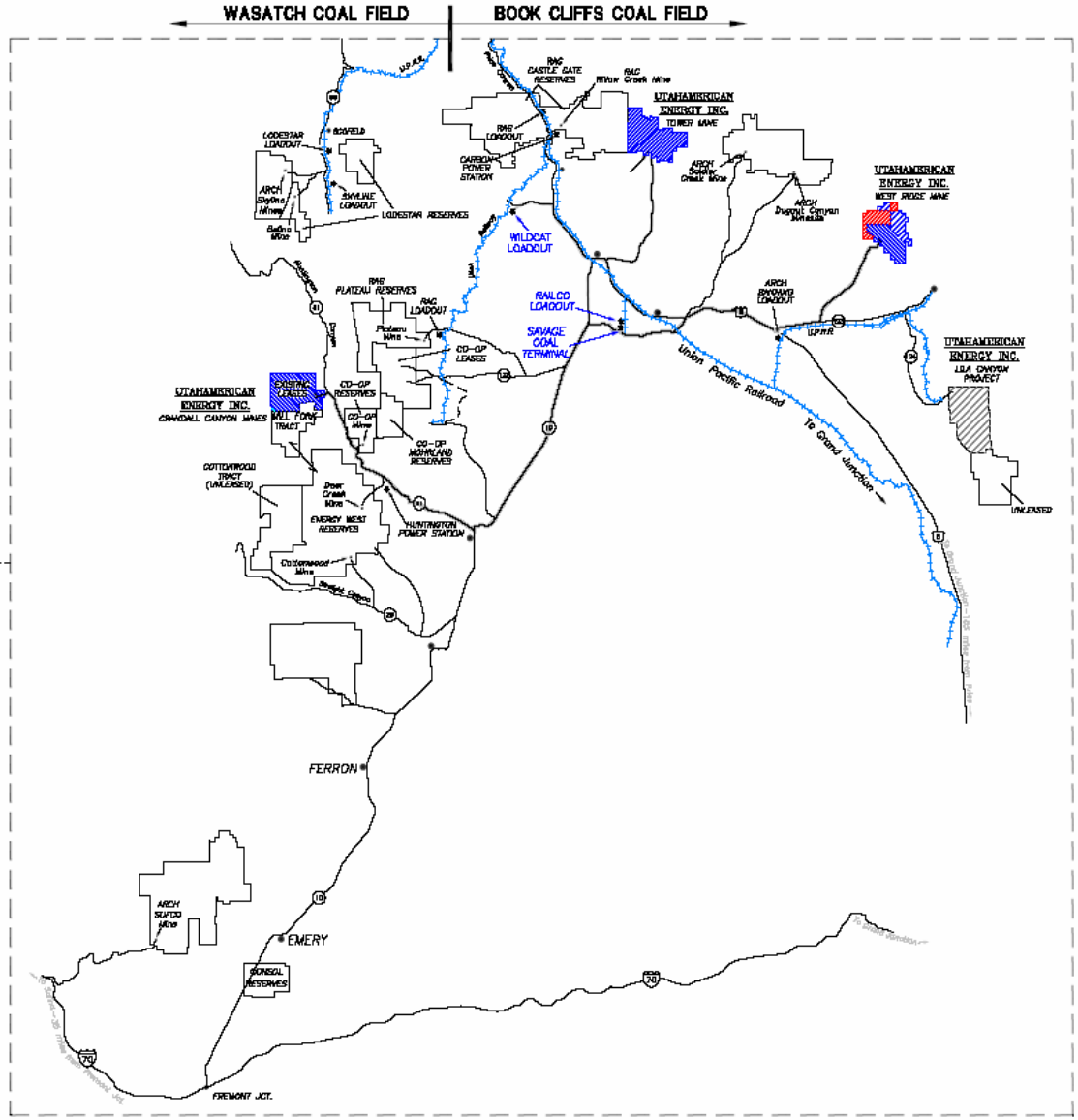
Belt Air Presentation




Channel Sandstone





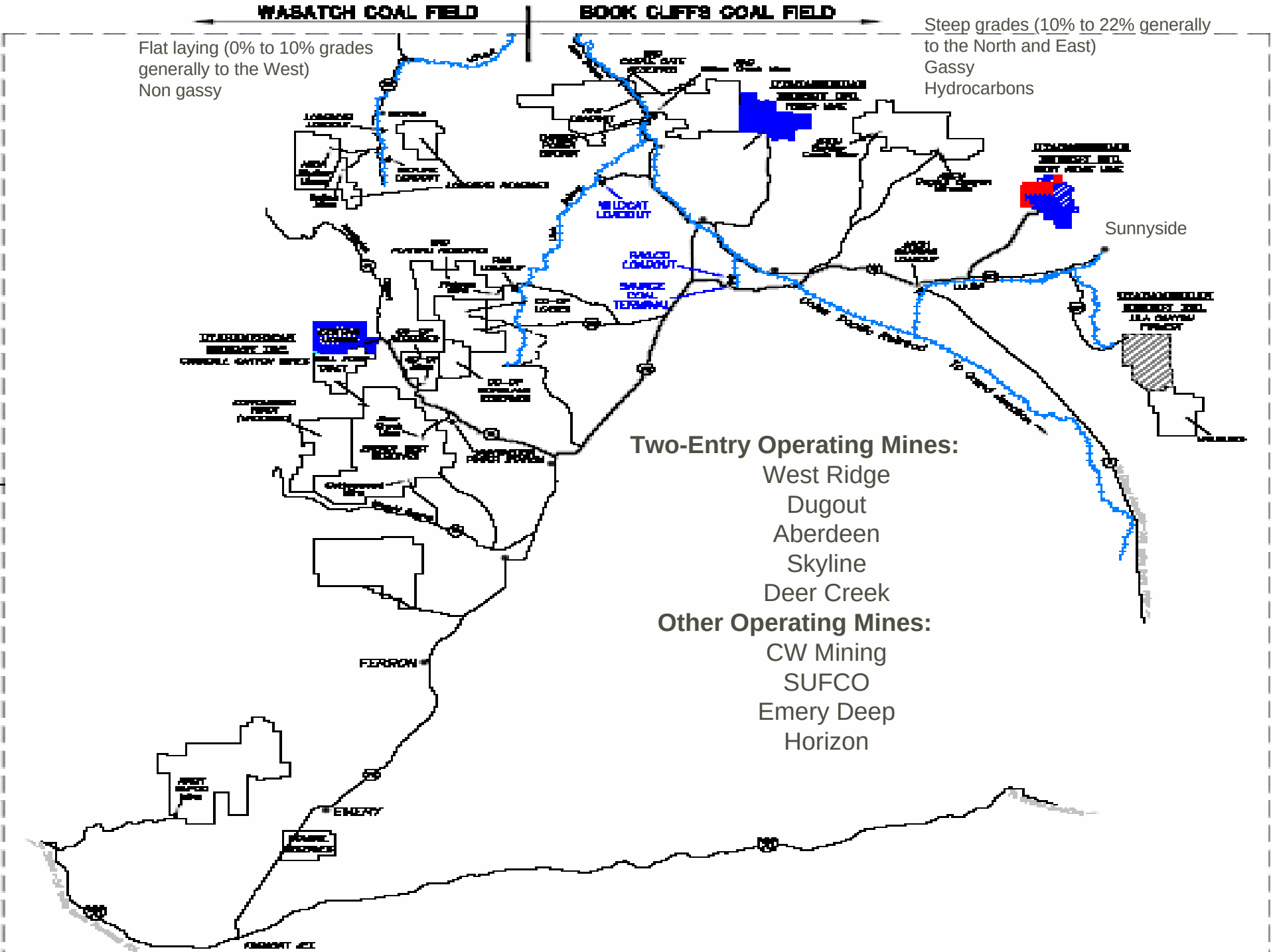


TRUCK MILEAGE

PROPERTIES	ANDALEX	GENWAL	WEST RIDGE
WILDCAT	22.0	45.0	36.4
SAVAGE	18.1	35.2	23.7
RAILCO	18.8	35.9	23.9

TRUCK HAULAGE ROUTE

CENTRAL UTAH LOCATION MAP


WASATCH COAL FIELD
BOOK CLIFFS COAL FIELD
Flat laying (0% to 10% grades generally to the West)
Non gassy
Steep grades (10% to 22% generally to the North and East)
Gassy
Hydrocarbons
Sunnyside
Two-Entry Operating Mines:
West Ridge
Dugout
Aberdeen
Skyline
Deer Creek
Other Operating Mines:
CW Mining
SUFCO
Emery Deep
Horizon
FERRON
EMERY

Mining History

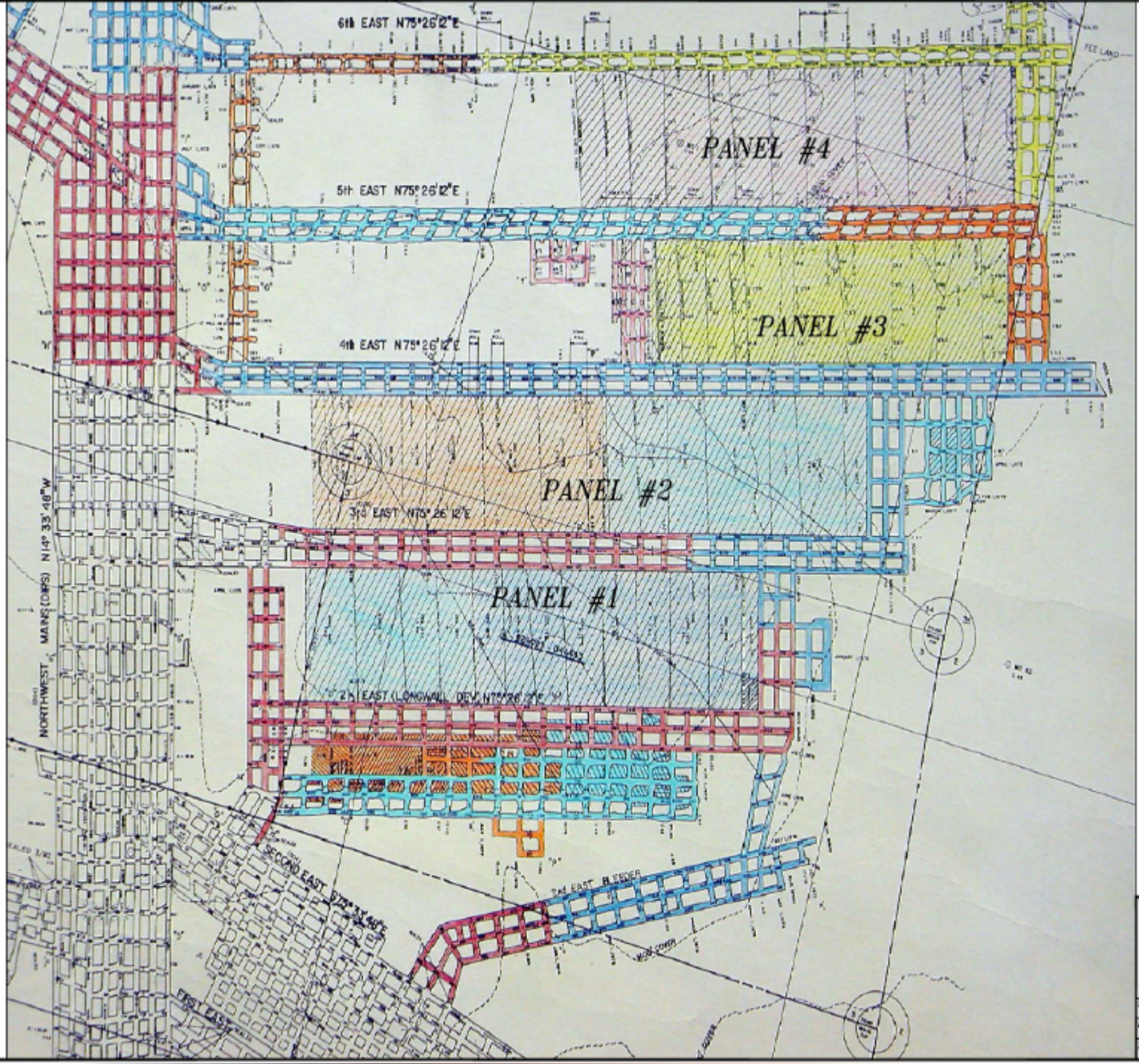
- Started in 1880's
  - 1,000 to 1,500 foot overburden barrier to second mining
- Best ground control
  - narrow entry widths
  - minimum number of entries
  - large stiff pillars in main entries
  - small yield pillars in panels

More Recent History

- John Peperakis
  - Bureau of Mines
  - Deeper than 1,500 feet
- Kaiser Steel Sunnyside Mine begins longwall mining 1962
- Two-entry yield pillar gateroads – based on experience (approved in RCP and VP)
- 41 longwall panels from 1962 to 1992 at depths up to 2900’ of cover

Other Mines Begin Longwalling

- Other mines decide start up longwall operations
  - Braztah
  - Deer Creek
  - Plateau
- Evaluation of gateroad designs
  - Bureau of Mines
  - Charles Holland
  - Arthur Wilson
  - National Coal Board
  - Others
- Had to demonstrate 3-entry would not work

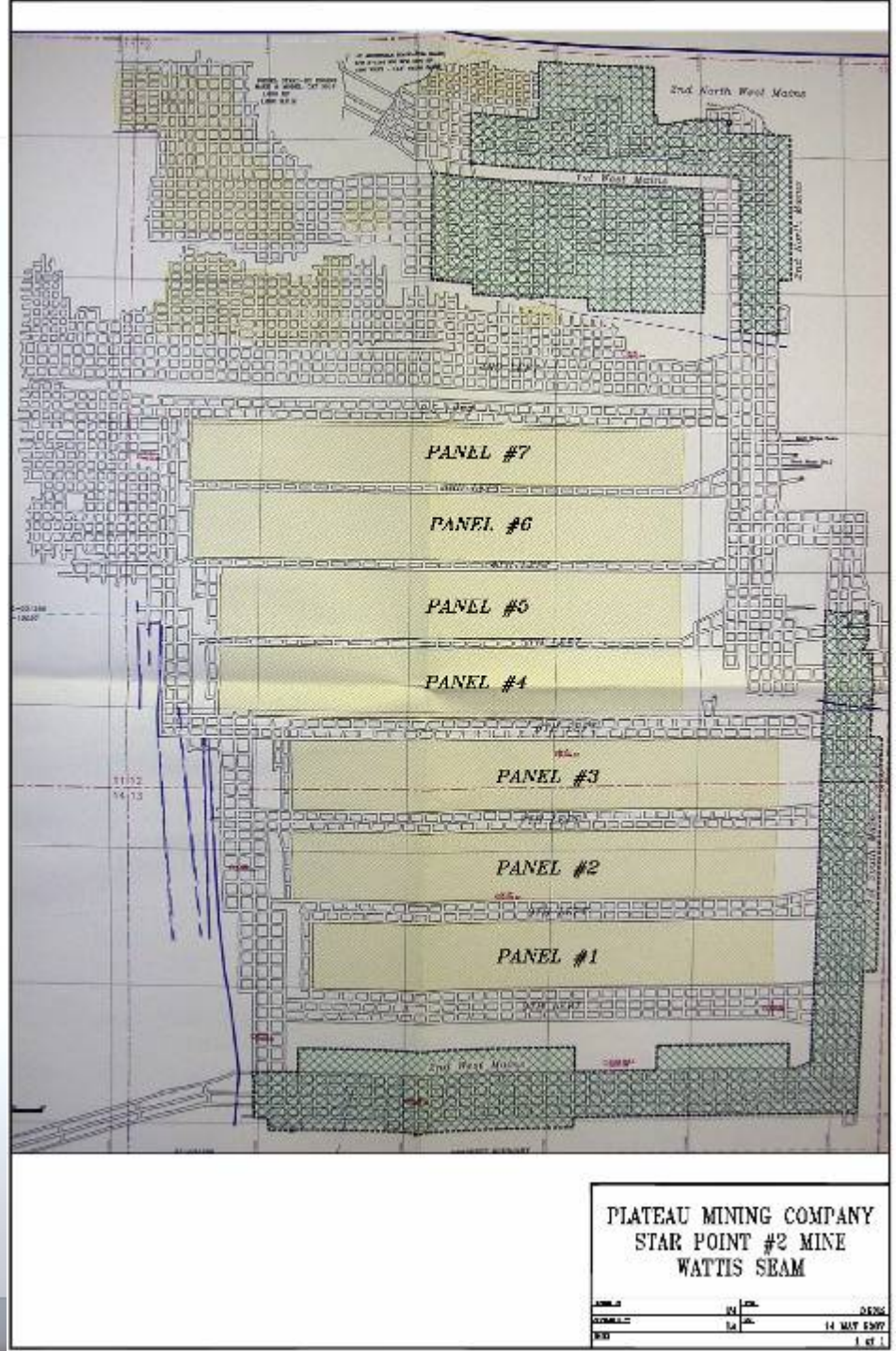


BRAZTAH CORP.
NUMBER 3 MINE
SUB-3 SEAM

DRWN BY PJ	SCALE NONE
APPROVED BY LA	DATE 14 MAY 2007
SHEET	1 of 1

UEI Tower Mine

Belt Air Presentation



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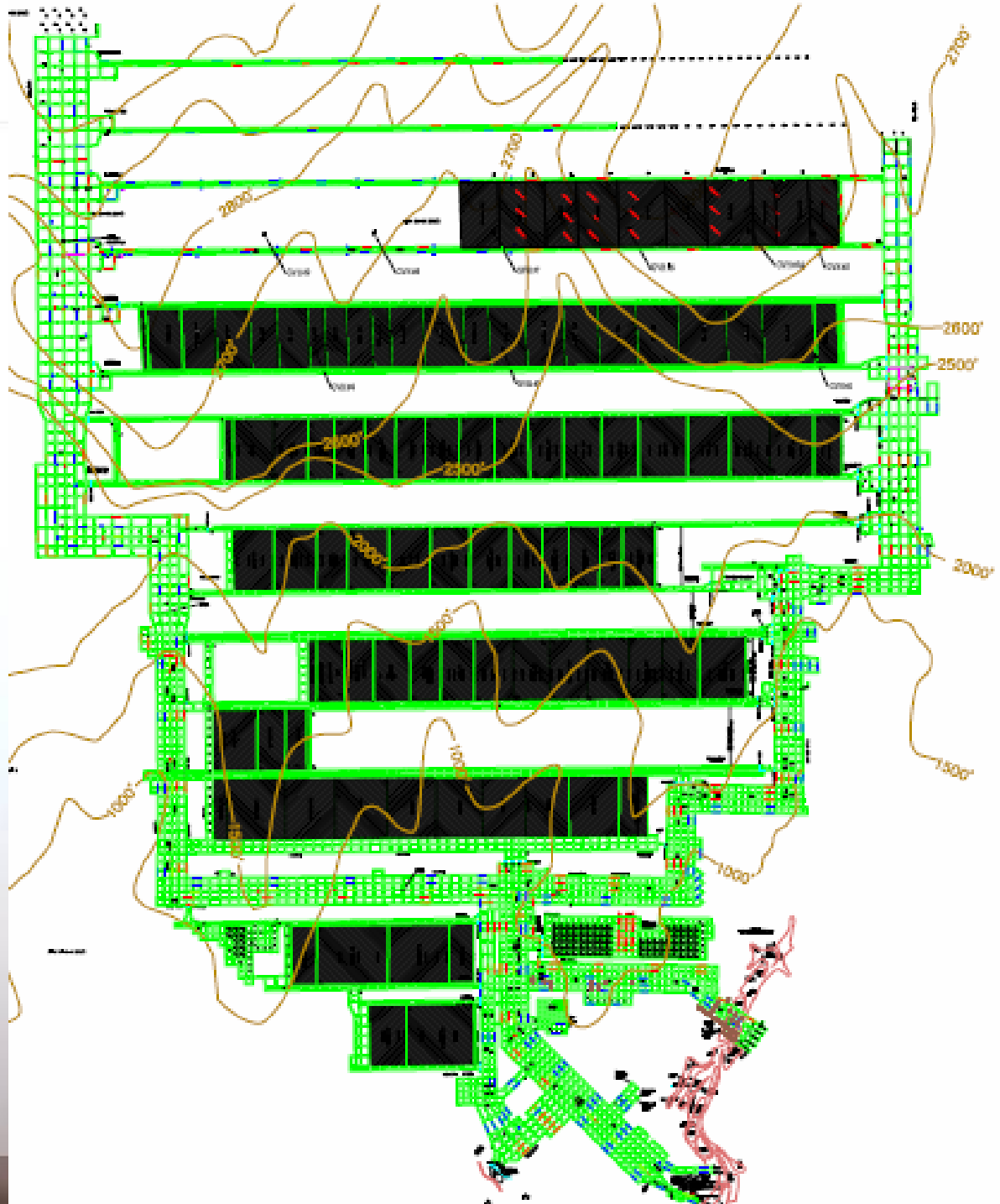

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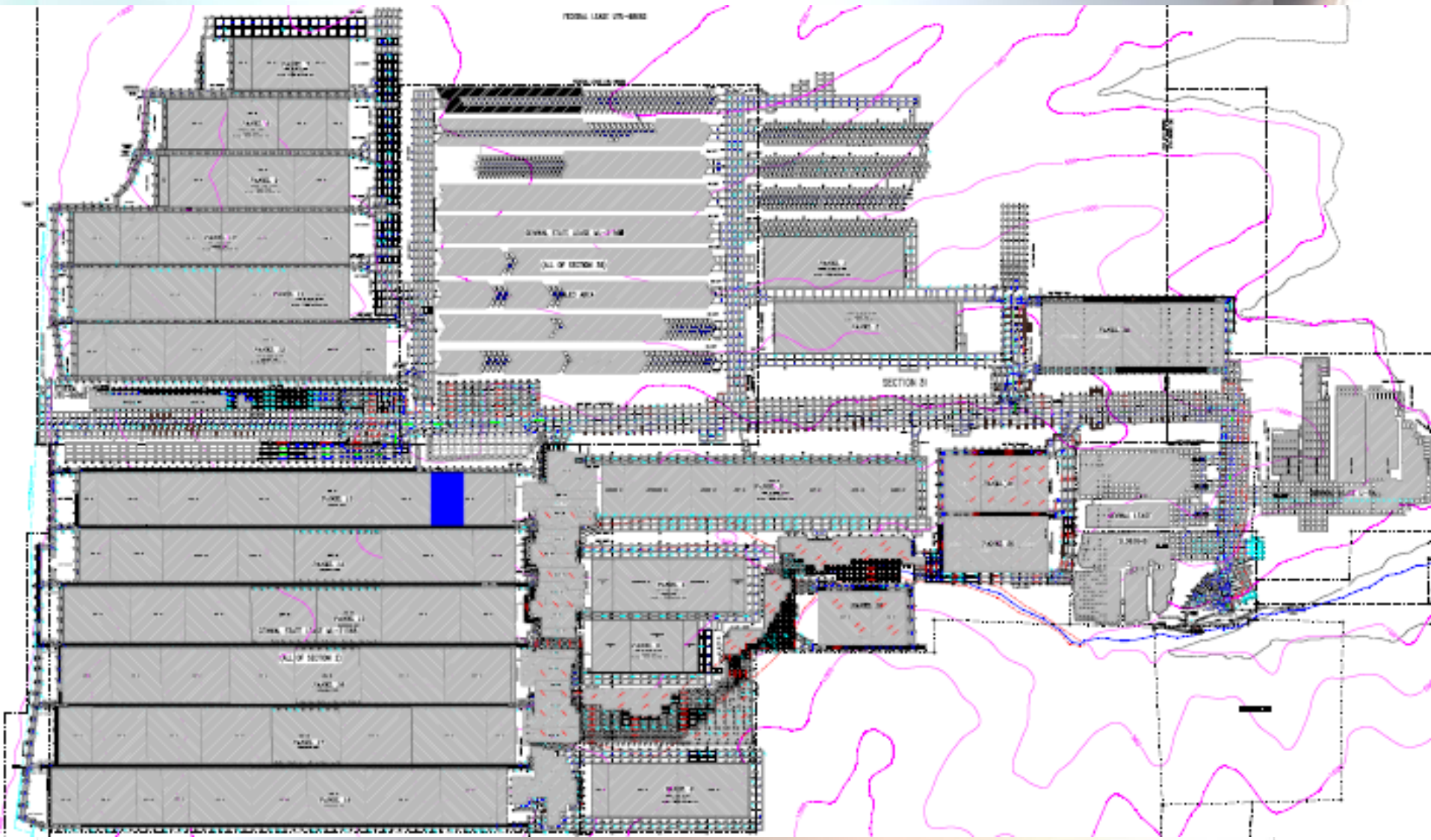
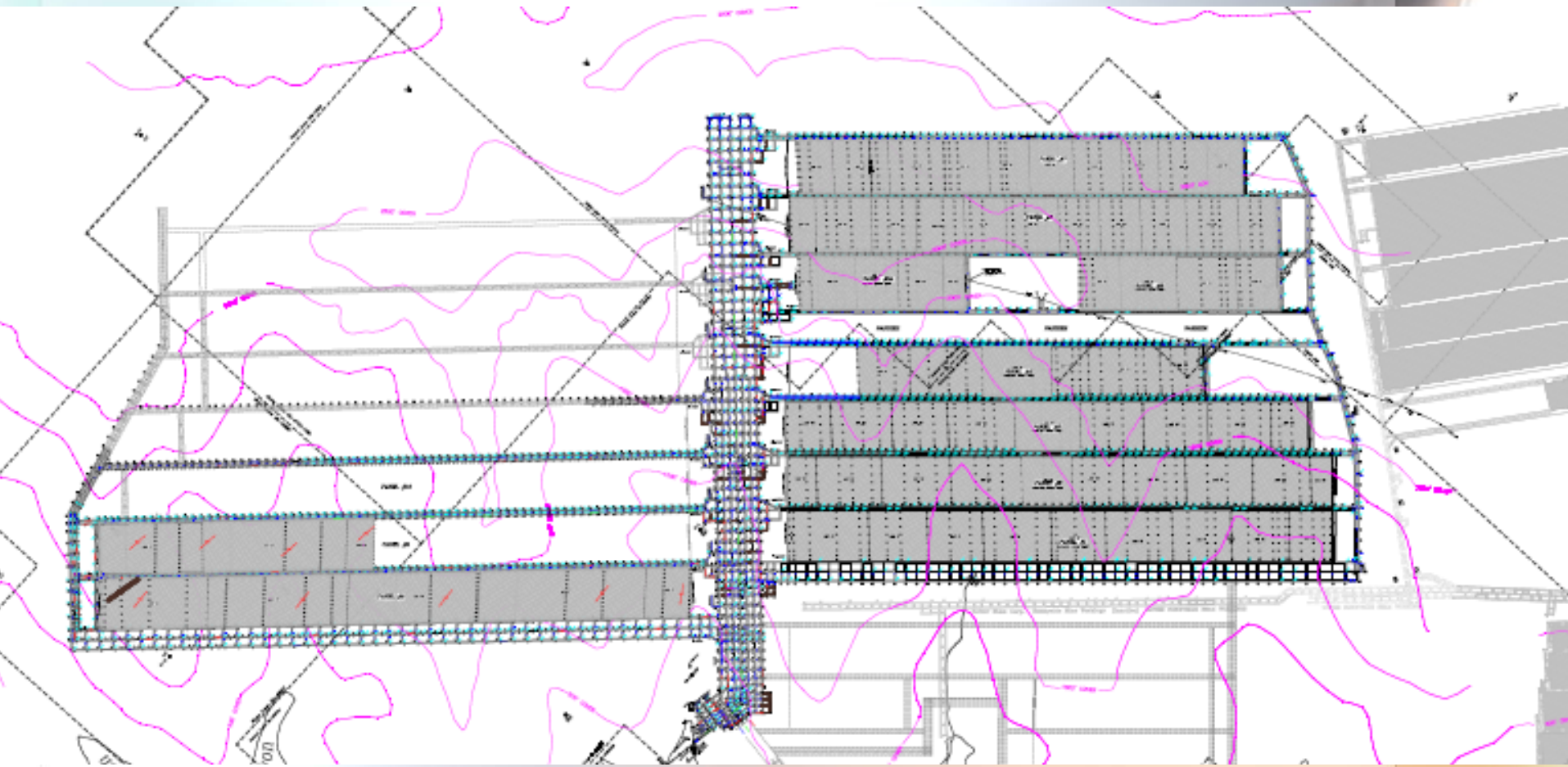


UEI Tower Mine

Belt Air Presentation



Wilberg Mine fire

- Wilberg Mine fire
  - December 19, 1984
  - Fire started by over heated compressor
- Mine was using 2-entry yield pillar longwall gate roads
  - Mines had to apply for “interim relief”
  - 101(c) Petitions required
- Disaster investigation team plus 2-Entry Task Force
- Final report said use of 2-entry, with additional recommendations, safest overall design for longwalls in Wasatch and Bookcliffs coal fields
  - AMS Systems
- Utah longwall mines granted Petitions and continued use of 2-entry
- Influential in rules governing use of belt air 30CFR75.350, 351 and 352.

Benefits of Using Belt Air

- 3 entries provide better ventilation if they can be held open
  - Severely restricted by:
    - supplemental roof and rib support
    - cave-ins
    - floor heave
    - rib sloughage
  - escapeways are compromised
- 2-entry longwall gate road systems significantly improve ventilation and escapeways over a three entry system that has significant ground control problems.
  - However, minimum number of entries increase resistance and requires high pressure ventilation system.
  - Belt air provides additional intake air and improves bleeder system

UtahAmerican Energy Inc. Aberdeen Mine

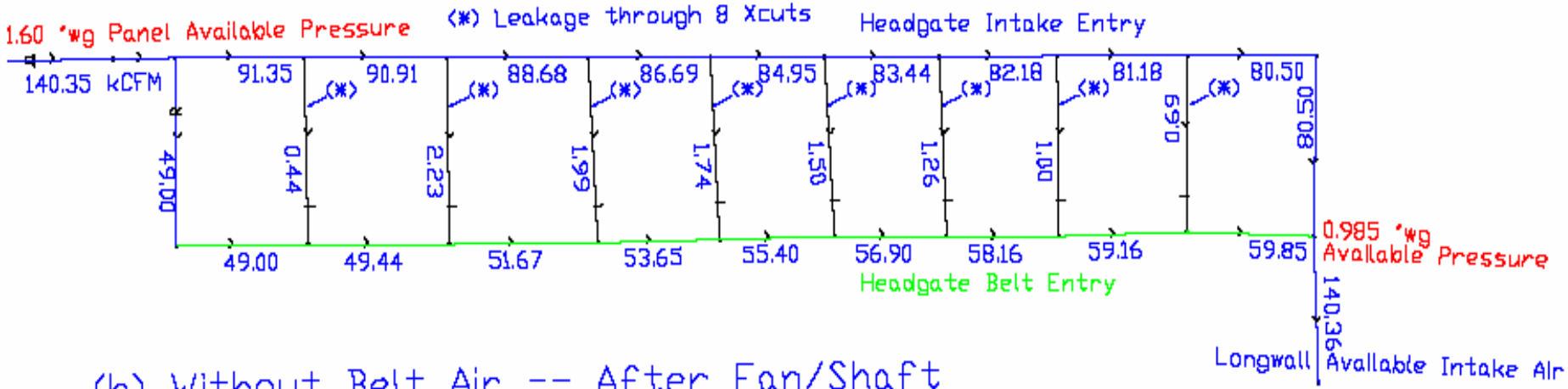
- Aberdeen mine
  - 7,000 tons per day
  - 2,000,000 tons per year
  - Liberates 11 million cubic feet methane per day
- 65% of methane from active longwall panel removed through vertical methane drainage holes
- 35% of methane removed by mine ventilation system

Push/Pull System

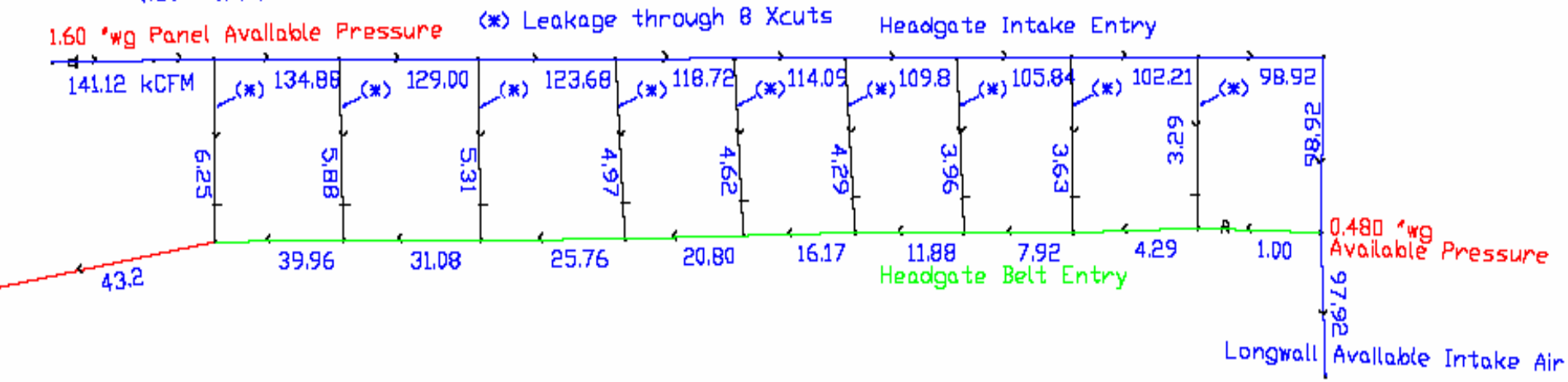
- Ventilation Upgraded
- Upgraded from exhausting system to Push / Pull system
- New intake ventilation shaft
- Blowing fan
- Cost about $1,500,000

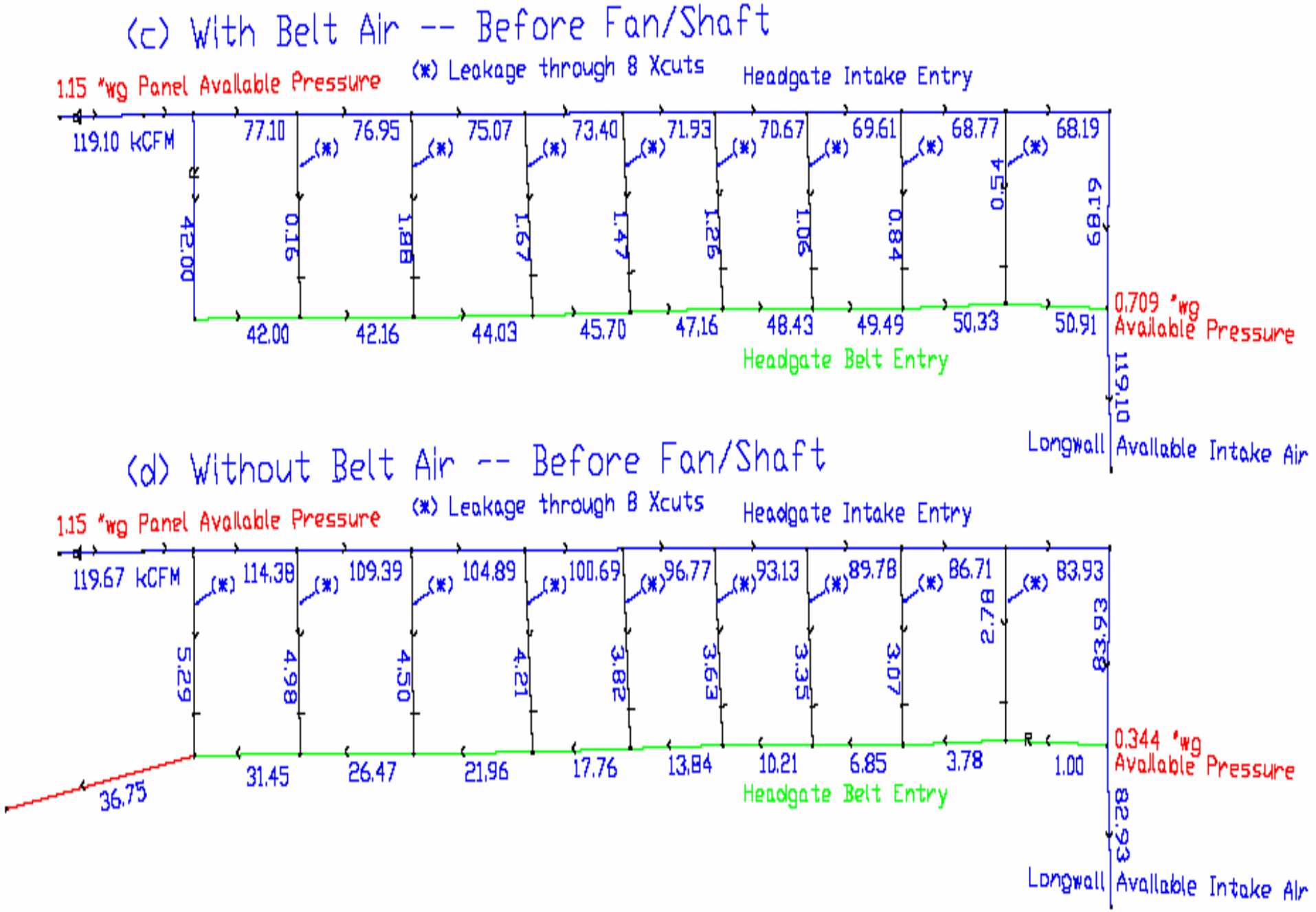
Tower Mine Longwall Panel 10
Effect of Utilizing Belt Air Before & After Ventilation Improvements
(including addition of Airshaft & Blowing Fan)

(a) With Belt Air -- After Fan/Shaft



(b) Without Belt Air -- After Fan/Shaft




(c) With Belt Air -- Before Fan/Shaft
(*) Leakage through 8 Xcuts
Headgate Intake Entry
1.15 "wg Panel Available Pressure
119.10 kCFM
77.10
76.95
75.07
73.40
71.93
70.67
69.61
68.77
68.19
42.00
0.16
1.88
1.67
1.47
1.26
1.06
0.84
0.54
68.19
42.00
42.16
44.03
45.70
47.16
48.43
49.49
50.33
50.91
0.709 "wg
Available Pressure
Headgate Belt Entry
119.10
Longwall
Available Intake Air
(d) Without Belt Air -- Before Fan/Shaft
(*) Leakage through 8 Xcuts
Headgate Intake Entry
1.15 "wg Panel Available Pressure
119.67 kCFM
114.38
109.39
104.89
100.69
96.77
93.13
89.78
86.71
83.93
5.29
4.98
4.50
4.21
3.82
3.63
3.35
3.07
2.78
83.93
36.75
31.45
26.47
21.96
17.76
13.84
10.21
6.85
3.78
1.00
0.344 "wg
Available Pressure
Headgate Belt Entry
82.93
Longwall
Available Intake Air

Benefits of Belt Air

Tower Mine Longwall Panel 10

Effect of Utilizing Belt Air Before & After Ventilation Upgrade

Case	Belt Air	Fan Upgrade	Air Available at Headgate (cfm)	Percent Increase with Belt Air	Diagonal Pressure at HG (inches w.g.)
a	**X**	**X**	140,000	42.9%	0.98
b		**X**	98,000		0.48
c	**X**		119,000	43.4%	0.71
d			83,000		0.34

Benefits of Belt Air

- Reduces methane concentrations in the belt entry, on the face and in the bleeders.
- Reduces respirable dust concentrations
- Provides more usable air at the face
- AMS systems improve safety of underground coal mines more than anything else.
  - Accurate
  - Dependable
  - Sophisticated
  - Well accepted by workforce – Confidence in the system
- CO detection rather than point-type heat sensors (as required by law).
- Escapeway routes not compromised by belt air – in fact, they are improved because of second intake airway.